

AMENDMENTS TO THE CLAIMS:

1.(currently amended): A time-division bit-interleave multiplexing method comprising:

(a) a step of generating a plurality of first signals and a plurality of second signals to ~~which specific pulse trains~~set in a second area of a low speed frame different from a first area of said low speed frame used for frame synchronization, and said second area of said low speed frame not used for frame synchronization are allocated respectively;

(b) a step of generating low speed frames accommodating low speed signals of plural channels including said first and second signals and transmission signals;

(c) a step of ~~partly converting~~ said first and second signals in said second area of each channel into either of "1/0" alternating signals, said "1/0" alternating signals being repeated patterns of bits "10", and "0/1" alternating signals, said "0/1" alternating signals being repeated patterns of bits "01"; and

(d) a step of time-division multiplexing said low speed frames accommodating said low speed signals after said step (c), thereby producing a high speed frame accommodating high speed signals; wherein said "1/0" alternating signals, and said "0/1" alternating signals are mapping to a third area of said high speed frame, and a mark rate in said third area mapped to said "1/0" alternating signals, and said "0/1" alternating signals becomes 50%.

2.(currently amended): A time-division bit-interleave multiplexing method comprising:

(a) a step of generating a plurality of first signals and a plurality of second signals to ~~which specific pulse trains~~set in a second area of a low speed frame different from a first area of said low speed frame used for frame synchronization, and said second area of said low speed frame not used for frame synchronization are allocated respectively;

(b) a step of generating low speed frames accommodating low speed signals of plural channels including said first and second signals and transmission signals;

(c) a step of ~~partly~~ converting said first and second signals in said second area of either of each odd channel and each even channel into "1/0" alternating signals, said "1/0" alternating signals being repeated patterns of bits "10", while ~~partly~~ converting said first and second signals in said second area of the other channels into "0/1" alternating signals, said "0/1" alternating signals being repeated patterns of bits "01"; and

(d) a step of time-division multiplexing said low speed frames accommodating said low speed signals after said step (c), thereby producing a high speed frame accommodating high speed signals; wherein said "1/0" alternating signals, and said "0/1" alternating signals are mapping to a third area of said high speed frame, and a mark rate in said third area mapped said "0/1" alternating signals and said "0/1" alternating signals becomes 50%.

3.(currently amended): A time-division bit-interleave multiplexing method comprising:

(a) a step of generating a plurality of first signals and a plurality of second signals to which specific-pulse-trains in a second area of a low speed frame different from a first area of said low speed frame used for frame synchronization, and said second area of said low speed frame not used for frame synchronization are allocated respectively;

(b) a step of generating low speed frames accommodating low speed signals of plural channels including said first and second signals and transmission signals;

(c) a step of ~~partly~~ converting said first and second signals in said second area of either of each odd channel and each even channel into all "0" signals, while ~~partly~~ converting said first and second signals in the other channels into all "1" signals; and

(d) a step of time-division multiplexing said low speed frames accommodating said low speed signals after said step (c), thereby producing a high speed frame accommodating high speed signals; wherein said all "0" signals, and said all "1" signals are mapping to a third area of said high speed frame, and a mark rate in said third area mapped said all "0" signals and said all "1" signals become 50%.

4.(currently amended): A time-division bit-interleave multiplexing method comprising:

(a) a step of generating a plurality of first signals and a plurality of second signals to which specific pulse trainset in a second area of a low speed frame different from a first area of said low speed frame used for frame synchronization, and said second area of said low speed frame not used for frame synchronization are allocated respectively;

(b) a step of generating low speed frames accommodating low speed signals of plural channels including said first and second signals and transmission signals;

(c) a step of partly converting said first and second signals in said second area of either of each odd channel and each even channel into inverted signals, and not converting said first and second signals in said second area of other of each odd channel and each even channel into inverted signals; and

(d) a step of time-division multiplexing said low speed frames accommodating said low speed signals after said step (c), thereby producing a high speed frame accommodating high speed signals; wherein said inverted signals and non inverted signals are mapping to a third area of said high speed frame, and a mark rate in said third area mapped said inverted signals and non inverted signals becomes 50%.

5.(previously presented): A time-division bit-interleave multiplexing method comprising:

- (a) a step of generating a plurality of first signals and a plurality of second signals to which specific pulse trains for frame synchronization are allocated respectively;
- (b) a step of generating low speed signals of plural channels including said first and second signals and transmission signals;
- (c) a step of partly converting said first and second signals in each channel into random patterns; and
- (d) a step of time-division multiplexing said low speed signals after said step (c), thereby producing high speed signals.

6.(currently amended): A time-division bit-interleave multiplexing method comprising:

- (a) a step of generating a plurality of first signals and a plurality of second signals to which specific pulse trains set in a second area of a low speed frame different from a first area of said low speed frame used for frame synchronization, and a second area of said low speed frame not used for frame synchronization are allocated respectively;
- (b) a step of generating low speed frames accommodating low speed signals of plural channels including said first and second signals and transmission signals;
- (c) a step of partly converting said first and second signals in said second area of either of each odd channel and each even channel into random patterns, while partly converting said first and second signals in said second area of the other channels into inverted random patterns obtained by inverting said random patterns; and
- (d) a step of time-division multiplexing said low speed frames accommodating said low speed signals after said step (c), thereby producing a high speed frame accommodating high

speed signals; wherein said inverted random patterns and said random patterns are mapping to a third area of said high speed frame, and a mark rate in said third area mapped said inverted random patterns and random patterns become 50%.

7.(previously presented): A time-division bit-interleave multiplexing method comprising:

(a) a step of generating a plurality of first signals and a plurality of second signals to which specific pulse trains for frame synchronization are allocated respectively;

(b) a step of generating low speed signals of plural channels including said first and second signals and transmission signals;

(c) a step of generating a random pattern, and then dividing one period of said random pattern by the number of said plural channels, hence obtaining plural different random patterns;

(d) a step of partly converting said first and second signals in each channel into each of said plural different random patterns; and

(e) a step of time-division multiplexing said low speed signals after said step (d), thereby producing high speed signals.

8.(currently amended): A time-division bit-interleave multiplexing method comprising:

(a) a step of generating a plurality of first signals and a plurality of second signals to which specific pulse trains for frame synchronization are allocated respectively in a first area and a second area of a low speed frame, said first area of said low speed frame being used for frame

synchronization and said second area of said low speed frame not being used for frame synchronization;

(b) a step of generating low speed frames accommodating low speed signals of plural channels including said first and second signals and transmission signals;

(c) a step of entirely converting said first and second signals in either of each odd channel and each even channel into inverted signals, and not converting said first and second signals in other of each odd channel and each even channel into inverted signals as non inverted signals; and

(d) a step of time-division multiplexing said low speed frames accommodating said low speed signals after said step (c), thereby producing a high speed frame accommodating high speed signals; wherein said inverted signals and non inverted signals are mapping to a third area of said high speed frame, and a mark rate in said third area mapped said inverted random patterns and random patterns becomes 50%.